

Design Decisions - POC

Microcontroller

- ESP32 S3 - A cheap yet powerful microcontroller that will be able to handle the job of powering the motor. It is lightweight too which makes it great for a project heavily based on weight.

Motor

- BrotherHobby VY 1504.5 2650KV Motor - Makes thrusts in the 500 lbs which is more than enough for the project. This is enough thrust to have some headspace in case the weight of the chassis is more than was expected (combined with the weight of the electronics themselves and maybe friction). The propeller has to be 5 inches in diameter. Weight is also pretty low which is a plus.

Motor Driver

- V-Good RC 32-Bit 30A 2-4S Brushless ESC - Works with the battery and the motor. The amount of max current is more than enough for the motor. Comes with SBEC but just needs the PWM and Ground pins to connect the ESP32 to the ESC.

Distance Sensor

- Adafruit VL53L0X - uses a laser to measure the distance. Has a range of up to 2 meters which is enough for this prototype. Just make sure the spot that the distance sensor uses to measure the distance is white for better reflectability.

Battery

- Lumenier 550mAh 4s 80c Lipo Battery - Has the required voltage for the motor and motor driver to run: both need 4s. The amount of current it can discharge is enough to cover the electronics.

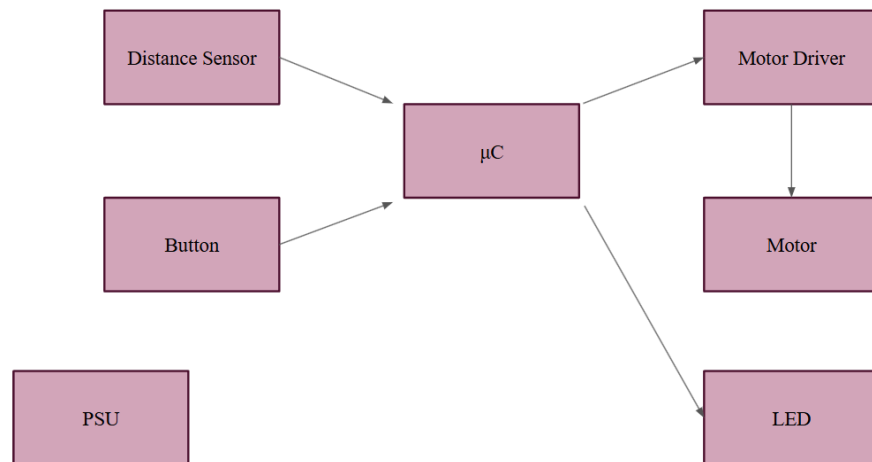
LED

- LED - have multiple LEDs as user interface showing the distance of the drone. For every 200 mm, an LED will turn on. The current max will be 5 LEDs at 1000 mm.

Button (Switch)

- Button - used to turn the drone on/off. Could also look into adding more functions in the future. It's easy to use and easy to implement to the hardware and software. Very lightweight.

Current Block Diagram:



Current Bill of Materials:

<u>Item</u>	<u>Link to Market Place</u>	<u>Status</u>
Microcontroller	ESP32 S3	Bought
Motor	BrotherHobby VY 1504.5 2650KV	Bought
ESC	V-Good RC 32-Bit 30A 2-4S Brushless ESC	Bought
Distance	Adafruit VL53L0X Time of Flight Distance Sensor	Bought
PSU	Lumenier 550mAh 4s 80c Lipo Battery (XT-30)	Bought
Charger	Gens Ace iMars Mini G-Tech 60W 2-4S 5A	Bought
Propeller	Gemfan Hurricane SL 5125 3-Blade Propeller	Bought
LED	N/A	Bought
Button	N/A	Bought